AMENDMENTS

In the Claims

Please amend claims 1, 18, 27, 39-42, 44-48, 50-54, 73, and 81 as shown herein.

Claims 1-86 are pending and are listed following:

1. (currently amended) A network system, comprising:

a first computer configured to maintain an object having an attribute~~, the attribute~~ comprised of individual linked values, each linked value having conflict-resolution data;

a second computer configured to replicate the object to generate a replica object and maintain the replica object; and

the second computer further configured to resolve a replication conflict between a linked value of the attribute in the object and the linked value of the attribute in the replica object, the replication conflict being resolved with the conflict-resolution data associated with the linked values.

2. (previously presented) A network system as recited in claim 1, wherein the second computer is further configured to compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict.

3. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value.

4. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value, and wherein the second computer is further configured to:

compare the version number associated with the linked value of the attribute in the object and the version number associated with the linked value of the attribute in the replica object to resolve the replication conflict; and

update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object.

5. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises an update indicator that corresponds to when an individual linked value is updated.

6. **(previously presented)** A network system as recited in claim 1, wherein the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is updated, and wherein the second computer is further configured to:

compare the update timestamp associated with the linked value of the attribute in the object and the update timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict; and

update the linked value of the attribute in the replica object if the linked value has an earlier update timestamp than the linked value of the attribute in the object.

7. **(previously presented)** A network system as recited in claim 1, wherein the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created.

8. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, and wherein the second computer is further configured to:

compare the creation timestamp associated with the linked value of the attribute in the object and the creation timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict; and

update the linked value of the attribute in the replica object if the linked value has an earlier creation timestamp than the linked value of the attribute in the object.

9. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value and an update indicator that corresponds to when the individual linked value is updated.

10. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is updated, and wherein the second computer is further configured to:

compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object; and

resolve the replication conflict in favor of the linked value that first has a higher version number, and second has a later update timestamp.

11. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is updated, and wherein the second computer is further configured to:

compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict;

update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object; and

if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has an earlier update timestamp than the linked value of the attribute in the object.

12. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created, a version indicator that corresponds to a version of the individual linked value, and an update indicator that corresponds to when the individual linked value is updated.

13. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is updated, and wherein the second computer is further configured to:

compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object; and

resolve the replication conflict in favor of the linked value that first has a later creation timestamp, second has a higher version number, and third has a later update timestamp.

14. (previously presented) A network system as recited in claim 1, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is updated, and wherein the second computer is further configured to:

compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict;

update the linked value of the attribute in the replica object if the linked value has an earlier creation timestamp than the linked value of the attribute in the object;

if the creation timestamp associated with the linked value of the attribute in the replica object is equivalent to the creation timestamp associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object; and

if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has an earlier update timestamp than the linked value of the attribute in the object.

15. (previously presented) A network system as recited in claim 1, wherein the individual linked values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value of the attribute in the object.

16. (previously presented) A network system as recited in claim 1, wherein the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the attribute in the object.

17. (previously presented) A network system as recited in claim 1, wherein the individual linked values have an associated deletion timestamp that corresponds to when an individual linked value is marked for deletion from the attribute in the object, and wherein the second computer is further configured to delete a linked value from the attribute in the object if the linked value has a deletion timestamp that indicates the linked value is marked for deletion.

18. (currently amended) A state-based replication system, comprising:

an object having ~~an~~ a multi-valued attribute that includes a value which is a reference link to multiple ~~comprised of~~ linked values, ~~individual linked values~~ each linked value having indicators to indicate a change to a corresponding linked value of the attribute; and

a computing device configured to replicate the object and identify a change to a linked value of the attribute by a change to one or more of the indicators ~~associated with~~ corresponding to the linked value.

19. (previously presented) A state-based replication system as recited in claim 18, wherein the computing device is further configured to:

maintain a replica object, the replica object being replicated from the object; and

compare the object with the replica object to identify, with the indicators, a linked value replication conflict.

20. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a version indicator that corresponds to a version of a linked value.

21. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise an update indicator that corresponds to when a linked value is changed.

22. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a creation indicator that corresponds to when a linked value is created.

23. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a version number that corresponds to a version of a linked value and an update timestamp that corresponds to when the linked value is changed.

24. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a creation timestamp that corresponds to when a linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed.

25. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a deletion indicator that has a null identifier to indicate the existence of a linked value of the attribute.

26. (previously presented) A state-based replication system as recited in claim 18, wherein the indicators comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute.

27. (currently amended) A state-based replication system, comprising:

a first computer configured to maintain a first data structure, the first data structure having a multi-valued attribute that includes a reference link to ~~comprised of~~ multiple linked values, ~~individual linked values~~ each linked value having conflict-resolution information to indicate a change to a corresponding linked value of the attribute;

a second computer configured to maintain a second data structure having the multi-valued attribute that includes the reference link to ~~comprised of~~ the multiple linked values; and

the first and second data structures configured to be replicated and to have a replication conflict between a linked value of the attribute in the first data structure and a linked value of the attribute in the second data structure resolved with the conflict-resolution information associated with the linked values.

28. (previously presented) A state-based replication system as recited in claim 27, wherein the first and second computers are further configured to:

compare the conflict-resolution information associated with the linked value of the attribute in the first data structure with the conflict-resolution information associated with the linked value of the attribute in the second data structure;

identify a replication conflict; and

resolve the replication conflict with the conflict-resolution information associated with the linked values.

29. (original) A state-based replication system as recited in claim 27, wherein the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value.

30. (original) A state-based replication system as recited in claim 27, wherein:

the conflict-resolution information comprises a version number that corresponds to a version of an individual linked value;

the first and second computers are further configured to compare the version number associated with the linked value of the attribute in the first data structure with the version number associated with the linked value of the attribute in the second data structure;

the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has a lower version number than the linked value of the attribute in the second data structure; and

the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has a lower version number than the linked value of the attribute in the first data structure.

31. (original) A state-based replication system as recited in claim 27, wherein the conflict-resolution information comprises an update indicator that corresponds to when an individual linked value is changed.

32. (original) A state-based replication system as recited in claim 27, wherein:

the conflict-resolution information comprises an update timestamp that corresponds to when an individual linked value is changed;

the first and second computers are further configured to compare the update timestamp associated with the linked value of the attribute in the first data structure with the update timestamp associated with the linked value of the attribute in the second data structure;

the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the second data structure; and

the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the first data structure.

33. (original) A state-based replication system as recited in claim 27, wherein the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created.

34. (original) A state-based replication system as recited in claim 27, wherein:

the conflict-resolution information comprises a creation timestamp that corresponds to when an individual linked value is created;

the first and second computers are further configured to compare the creation timestamp associated with the linked value of the attribute in the first data structure with the creation timestamp associated with the linked value of the attribute in the second data structure;

the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the second data structure; and

the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the first data structure.

35. (original) A state-based replication system as recited in claim 27, wherein the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value and an update indicator that corresponds to when the individual linked value is changed.

36. (original) A state-based replication system as recited in claim 27, wherein the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created, a version indicator that corresponds to a version of the individual linked value, and an update indicator that corresponds to when the individual linked value is changed.

37. (original) A state-based replication system as recited in claim 27, wherein the individual linked values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value of the multi-valued attribute.

38. (original) A state-based replication system as recited in claim 27, wherein the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute.

39. (currently amended) A computer-readable medium having stored thereon a first data structure and a second data structure, comprising:

a first data field of the first data structure containing an attribute;

a second data field of the first data structure containing a ~~linked~~ value of the attribute contained in the first data field, the value being a reference link to multiple linked values contained in the second data structure;

a ~~third~~ first data field of the second data structure containing a version indicator corresponding to a version of ~~the~~ a linked value contained in the second data ~~field~~ structure; and

a ~~fourth~~ second data field of the second data structure containing an update indicator corresponding to when the version indicator contained in the ~~third~~ first data field of the second data structure is changed.

40. (currently amended) A computer-readable medium as recited in claim 39, wherein the second data structure further comprises a ~~fifth~~ third data field containing a creation indicator corresponding to when the linked value contained in the second data ~~field~~ structure is created.

41. (currently amended) A computer-readable medium as recited in claim 39, wherein the second data structure further comprises a ~~sixth~~ third data field containing a deletion indicator corresponding to the linked value contained in the second data ~~field~~ structure and configured to indicate when the linked value is marked for deletion from the second data structure.

42. (currently amended) A network system, comprising:

a first computer configured to replicate objects at an attribute level, and further configured to maintain an object having a multi-valued attribute~~, the multi-valued attribute comprised of~~ that includes a value which is a reference link to multiple linked values;

a second computer configured to replicate the objects at an attribute value level, and further configured to maintain a second object~~, the second object~~ having ~~a~~ the multi-valued attribute ~~comprised of~~ that includes the reference link to the multiple linked values, ~~the multiple linked values~~ each linked value configured to have conflict-resolution data;

the first computer further configured to:

replicate the second object from the second computer; and

resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data associated with a linked value.

43. (original) A network system as recited in claim 42, wherein the first computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level.

44. (currently amended) A network system as recited in claim 42, wherein the first computer does not replicate a linked value from the second object if the linked value does not have conflict-resolution data.

45. (currently amended) A network system as recited in claim 42, wherein the first computer does not replicate a linked value from the second object if the linked value has null conflict-resolution data.

46. (currently amended) A network system as recited in claim 42, wherein the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data.

47. (currently amended) A network system as recited in claim 42, wherein the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has non-null conflict-resolution data.

48. (currently amended) A network system as recited in claim 42, wherein the second computer is further configured to:

replicate the object from the first computer; and

resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data associated with a linked value.

49. (original) A network system as recited in claim 48, wherein the second computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level.

50. (currently amended) A network system as recited in claim 48, wherein the second computer does not replicate a linked value from the object if the linked value does not have conflict-resolution data.

51. (currently amended) A network system as recited in claim 48, wherein the second computer does not replicate a linked value from the object if the linked value has null conflict-resolution data.

52. (currently amended) A network system as recited in claim 48, wherein the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data.

53. (currently amended) A network system as recited in claim 48, wherein the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has non-null conflict-resolution data.

54. (currently amended) A network system as recited in claim 48, wherein the second computer is further configured to delete a linked value from the second object if the linked value does not have conflict resolution data, and if the linked value is not replicated from the object.

55. (previously presented) A method, comprising:

replicating an object stored in a first directory with a replica object stored in a second directory, the object and the replica object each having an attribute comprised of multiple linked values, the multiple linked values each having conflict-resolution data;

comparing an individual linked value of the attribute in the object with an individual linked value of the attribute in the replica object to identify a replication conflict; and

resolving the replication conflict with the conflict-resolution data associated with the individual linked values.

56. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value, and wherein said comparing comprises determining if an individual linked value version number has been changed.

57. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value, said comparing comprises determining if an individual linked value version number has been changed, and the method further comprises updating the individual linked value of the attribute that has a lower version number with the individual linked value of the attribute that has a higher version number.

58. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed, and wherein said comparing comprises determining if an individual linked value update timestamp has been changed.

59. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed, said comparing comprises determining if an individual linked value update timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier update timestamp with the individual linked value of the attribute that has a later update timestamp.

60. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, and wherein said comparing comprises determining if a creation timestamp has been changed.

61. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, said comparing comprises determining if a creation timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier creation timestamp with the individual linked value of the attribute that has a later creation timestamp.

62. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed, and wherein said comparing comprises determining if ~~a~~ an individual linked value version number has been changed and if the individual linked value update timestamp has been changed.

63. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed, and the method further comprises updating the individual linked value of the attribute that first has a lower version number, and second has an earlier update timestamp.

64. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 63.

65. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed, and wherein said comparing comprises determining if ~~a~~ an individual linked value creation timestamp has been changed, if the individual linked value version number has been changed, and if the individual linked value update timestamp has been changed.

66. (previously presented) A method as recited in claim 55, wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed, and the method further comprises updating the individual linked value of the attribute that first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp.

67. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 66.

68. (previously presented) A method as recited in claim 55, wherein the individual linked values have a deletion timestamp that is a null identifier to indicate the existence of a linked value of the attribute.

69. (previously presented) A method as recited in claim 55, wherein the individual linked values have a deletion timestamp that corresponds to when an individual linked value is marked for deletion from the attribute.

70. (previously presented) A method as recited in claim 55, wherein the individual linked values have a deletion timestamp that corresponds to when an individual linked value is marked for deletion from the attribute, and the method further comprises deleting a linked value from the attribute if the linked value has a deletion timestamp that indicates the linked value is marked for deletion.

71. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 70.

72. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 55.

73. (currently amended) A method for replicating a linked value of a multi-valued attribute contained in an object, the linked value having conflict-resolution information and replicated from a replica object having the multi-valued attribute and the linked value, the method comprising:

comparing the conflict-resolution information associated with the linked value in the object with the conflict-resolution information associated with the linked value in the replica object;

identifying a replication conflict with the conflict-resolution information associated with the linked values; and

resolving the replication conflict with the conflict-resolution information.

74. (original) A method as recited in claim 73, wherein the conflict-resolution information comprises a version number that corresponds to a version of the linked value, and the method further comprising:

determining if the linked value version number has been changed; and

updating the linked value of the attribute that has a lower version number with the linked value of the attribute that has a higher version number.

75. (original) A method as recited in claim 73, wherein the conflict-resolution information comprises an update timestamp that corresponds to when the linked value is changed, and the method further comprising:

determining if the linked value update timestamp has been changed; and

updating the linked value of the attribute that has an earlier update timestamp with the linked value of the attribute that has a later update timestamp.

76. (original) A method as recited in claim 73, wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, and the method further comprising:

determining if the linked value creation timestamp has been changed; and

updating the linked value of the attribute that has an earlier creation timestamp with the linked value of the attribute that has a later creation timestamp.

77. (original) A method as recited in claim 73, wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed.

78. (original) A method as recited in claim 73, wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed, and the method further comprises updating the linked value of the attribute if the linked value first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp.

79. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 78.

80. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 73.

81. (previously presented) A method, comprising:

replicating a first object with a second object, the first object having an attribute that includes a value which is a reference link to ~~comprised of~~ multiple linked values, the second object having an attribute that includes a value which is the reference link to the ~~comprised of~~ multiple linked values, each linked value configured to have associated conflict-resolution data;

resolving first a replication conflict between the first object and the second object at an attribute level; and

resolving second~~, with the conflict resolution data,~~ a replication conflict between the first object and the second object at an attribute value level with the conflict-resolution data associated with the multiple linked values.

82. (previously presented) A method as recited in claim 81, further comprising determining whether a linked value corresponding to the second object has conflict-resolution data and said replicating the linked value if said determining that the linked value has conflict-resolution data.

83. (previously presented) A method as recited in claim 81, further comprising determining whether a linked value corresponding to the second object has non-null conflict-resolution data and said replicating the linked value if said determining that the linked value has non-null conflict-resolution data.

84. (previously presented) A method as recited in claim 81, said resolving the replication conflict between the first object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data.

85. (previously presented) A method as recited in claim 81, further comprising deleting a linked value corresponding to the second object if the linked value does not have conflict-resolution data and if the linked value is not replicated.

86. (original) A computer-readable medium comprising computer executable instructions that, when executed, direct a computing system to perform the method of claim 81.